



## **Development of academics educating future generations of chemical engineers**

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### **Highlights**

- Benefits of a structured programme to assist engineering educators in their practice are highlighted.
- Overview of training activities is provided.
- Experiences of graduates of the programme demonstrate the added value of this training provision.

### **1. Introduction**

Advances in learning technologies and the educational history and preferences of current generations of chemical engineering students increase the demands on the educators to develop their skills in new pedagogical methodologies, not just in technical aspects of their profession. In order to address current and future societal challenges, the future engineering professionals must be educated to develop into autonomous learners, capable of continuously acquiring new technical knowledge and essential professional competencies. Chemical engineering profession is particularly dependent on these characteristics to be fully developed in the graduates as soon as possible (preferably before graduation), although pedagogical literature clearly indicates the significant challenges in achieving these goals (e.g. [1]). Innovative pedagogical interventions, such as 'flipping' the classroom delivery and concentrating on the higher cognitive skills of the students have been identified as an effective method of deeper learning ([2], [3]). However, in order to achieve effective learning experience for the students, it is essential that the academics are confident not only in the technical aspects, but also pedagogical methodologies they need to implement. It is particularly pertinent with the move towards more technology enabled learning, when a range of tools and approaches is available to support the educators and the learners.

Newcastle University has been operating a structured programme of support and development of new-to-teaching academics for a number of decades now. This contribution will describe the structure of this training programme and highlight the experiences of the academics undertaking this course, both through the results of a survey of programme benefits and impact on the participants and through personal reflections of chemical engineering educators, who have completed the programme in recent years.

### **2. Programme structure**

Certificate in Advanced Studies in Academic Practice (CASAP) programme aims to provide participants with the opportunity to critically reflect upon, evaluate, and develop their professional



practice as academics or support staff at Newcastle University in the light of relevant scholarship and research, responding positively to the institutional mission, the external context and the diversity of the student population. It also supports participants in developing appropriate knowledge and understanding, skills and professional values for academic practice; and the development of these, in alignment with the UK Professional Standards Framework [4]. In addition, it provides a fertile environment for participants to learn from and work effectively with colleagues from diverse academic backgrounds on matters of academic practice.

The programme brings together academics from all disciplines within the University, who undertake a series of modules including formal instruction of the latest pedagogical research developments in University-level education, technology enabled learning and assessment and practice these in active delivery of teaching. Participants are supported by experienced mentors (Faculty Programme Liaison Officers, FPLOs) – academics with long-standing experience and excellence in teaching. The assessment of the programme consists of a range of activities requiring reflection on personal practice that will be detailed during the presentation

### **3. Results and discussion**

The effectiveness of the programme is regularly evaluated through the feedback questionnaires administered to the participants. In addition, a longitudinal evaluation of the programme was recently carried out to evaluate the long-term impact of this initiative upon the personal pedagogical practice of participants. These evaluations highlight that being observed and getting the feedback, meeting others from different backgrounds, having time to think about teaching and learning and having a professional standards adviser to talk with are highly valued by those that undertake this programme. In addition, the hands on delivery and 1:1 feedback from an observation, seeing others deliver in an engaging way, feedback on a video-recorded teaching activity, discussion and debate and working through ideas and issues with fellow teachers who do similar styles of teaching was seen a highly valuable practical support for future academic practice. In terms of pedagogical scholarship, learning about the range of learning theories and teaching methods that could extend my practice, talking to a range of teaching staff from other academic disciplines and having a teaching observation and the associated conversations and developing pedagogical vocabulary and familiarity with some teaching theories; sharing experiences; learning about new techniques; and being able to complete a project was highly valued. Detailed results and personal experiences of a chemical engineering participant will be shared during the presentation.

### **4. Conclusions**

The importance of a structured training programme for new-to-teaching academics is highlighted through this contribution and supported by evidence from the participants. Details of the programme and the experiences of chemical engineering academics undertaking the training will be discussed in detail in the presentation.

### **References**

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